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Customer Number

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Case No.: 52955US011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	DEBE, MARK K.		
Application No.:	10/014268	Confirmation No.:	5103
Filed:	October 22, 2001	Group Art Unit	1795
Title:	STORAGE AND DELIVERY OF GASES IN PRESSURIZED MICROBUBBLES		

BRIEF ON APPEAL

Mail Stop: Appeal Brief-Patents
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P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR § 1.8(a)]
I hereby certify that this correspondence is being transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at 571-273-8300.

April 18, 2008 — Signed by: Philip Dahl
Date

Dear Sir:

This is an appeal from the Office Action mailed on November 19, 2007, finally rejecting claims 31-33.

Fees

- ☐ Any required fee under 37 CFR § 41.20(b)(2) will be made at the time of submission via EFS-Web. In the event fees are not or cannot be paid at the time of EFS-Web submission, please charge any fees under 37 CFR § 1.17 which may be required to Deposit Account No. 13-3723.
- ☒ Please charge any fees under 37 CFR §§ 37 CFR § 41.20(b)(2)1.16 and 1.17 which may be required to Deposit Account No. 13-3723.
- ☒ Please charge any additional fees associated with the prosecution of this application to Deposit Account No. 13-3723. This authorization includes the fee for any necessary extension of time under 37 CFR § 1.136(a). To the extent any such extension should become necessary, it is hereby requested.
- ☒ Please credit any overpayment to the same deposit account.

A Notice of Appeal in this application was mailed on January 18, 2008, and was received in the USPTO on January 18, 2008.

REAL PARTY IN INTEREST

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

STATUS OF CLAIMS

Claims 1-33 are pending. Claims 1-30 are withdrawn. Claims 31-33 stand rejected and are the subject of the present appeal.

STATUS OF AMENDMENTS

No amendments have been filed after the final rejection.

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SUMMARY OF CLAIMED SUBJECT MATTER

The claims at issue concern an apparatus for delivering gas at a controlled rate (see, e.g., Figs. 8a and 8b and accompanying text) comprising: a) an article comprising at least one containment means comprising pressurized gas-filled microbubbles (see, e.g., index number 66 of Fig. 8a or index number 76 of Fig. 8b and accompanying text, and Specification, e.g., at page 7, line 9 – page 8, line 23), said gas being releasable on demand, b) a means for causing release of said gas from said microbubbles by fracturing (see, e.g., index numbers 65 and 68 of Fig. 8a or index numbers 77 and 78 of Fig. 8b and accompanying text), and c) a feedback and control means (see, e.g., Fig. 3 and Specification at page 13, line 19 – page 14, line 14) for releasing gas to an electrochemical power device (see, e.g., Specification at page 15, line 26 – page 16, line 13) at a controlled rate determined by a load.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

First Ground of Rejection

Claims 31 and 32 stand rejected under 35 USC § 102(b) as purportedly anticipated by GB 1,439,440 (Pedrick).

Second Ground of Rejection

Claims 31-33 stand rejected under 35 USC § 103(a) as purportedly unpatentable over Monsler in view of US5,432,710 (Ishimaru) or US 5,009,067 (Scheffler).

ARGUMENT

First Ground of Rejection

Claims 31 and 32 stand rejected under 35 USC § 102(b) as purportedly anticipated by GB 1,439,440 (Pedrick). Applicants respectfully request reversal of this rejection.

Pedrick is a curious reference. Upon examination and reflection, it can be seen that the device disclosed by Pedrick has very little functionality, and furthermore, can in no way anticipate the present claims. Pedrick purports to disclose "A reciprocating piston internal combustion engine in which fuel is fed into the space above the piston . . . in an encapsulated form . . . ." (Pedrick at claim 1). However, the depicted device is only capable of one rate of fuel consumption and therefore one rate of power output. It is apparent from Fig. 7 and the accompanying description that **Pedrick's device must consume exactly one "fuel pellet" per cycle**, no more or less. The Pedrick device is not capable of adjusting to consume more fuel per cycle in response to an increasing load.

The present claims teach an apparatus for delivering gas at a controlled rate comprising, *inter alia*, "a) an article comprising at least one containment means comprising pressurized gas-filled microbubbles, *said gas being releasable on demand*," and "c) a feedback and control means for releasing gas to an electrochemical power device *at a controlled rate determined by a load*." However, since Pedrick teaches a device which consumes exactly one "fuel pellet" per cycle, it is not capable of adjustment to consume more fuel per cycle in response to an increasing load. Therefore, Pedrick fails to teach or suggest a device that releases gas "at a controlled rate determined by a load," as recited in the present claims, nor does the Pedrick device release gas "on demand".

The November 19 Office Action asserts that a throttle could be fitted to Pedrick's device and that such an adaptation is inherent to the teachings of Pedrick. However, fitting a throttle to Pedrick's device is not taught or implied anywhere in Pedrick, and, more importantly, is in fact impossible. A throttle controls the amount of fuel sent to the engine. No such control is possible with the Pedrick device, which can only operate at a single rate of fuel input and a single rate of power output.

In addition, claim 31 recites "an electrochemical power device." Pedrick fails to teach or suggest an electrochemical power device as recited in the present claims. Like the issue

addressed above, this failing of Pedrick is in itself dispositive of this rejection. However, the November 19 Office Action does not respond to this argument.

Thus, the rejection of claims 31 and 32 under 35 USC § 102(b) has been overcome and should be reversed.

Second Ground of Rejection

Claims 31-33 stand rejected under 35 USC § 103(a) as purportedly unpatentable over Monsler et al, "Glass Microshell Parameters for Safe Economical Storage and Transport of Gaseous Hydrogen," April 1, 1996, Fuel Cells for Transportation TOPTEC Meeting (Monsler) in view of US5,432,710 (Ishimaru) or US 5,009,067 (Scheffler). Applicants respectfully request reversal of this rejection.

It is axiomatic that, in order to establish a prima facie case of obviousness of a claim, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)(cited at MPEP § 2143.03). In the present case, no anticipation and no prima facie case of obviousness have been established because the cited references fail to teach or suggest claim limitations recited in the present claims.

The present claims teach an apparatus comprising "b) a means for causing release of said gas from said microbubbles by fracturing." Each of these rejections under § 103(a) depend on the purported teaching of this element in Monsler, specifically at pages 4-5. However, Monsler instead teaches "The hydrogen can be released by heating the microspheres" (Monsler at 5). The Background Art section of the present Specification makes note of such methods: "in bulk hydrogen storage in glass microbubbles, the microbubbles are heated to temperatures on the order of 250 °C or higher to cause release of the hydrogen by diffusion through the glass microbubble walls." (Specification at page 2, lines 1-3.) Monsler fails to teach or suggest element b) of the present claims, and therefore this rejection of claims 31-33 under 35 USC § 103(a) should be reversed.

The November 19 Office Action asserts, without citing support, that release of hydrogen from microbubbles by heating *is* fracturing, and further asserts, again without support, "The bubbles become porous, and thus fractured, at high temperatures." (Nov. 19 Office Action at page 5). The Monsler reference itself demonstrates that this is not so. Under the heading,

"Filling the Glass Microspheres," Monsler states: "The permeability of glass to hydrogen is such a strong function of temperature that the glass effectively switches from impermeable @ 27°C to porous @ 150-200°C" (Monsler at 14). Monsler also presents a graph, titled, "Permeability constant vs. temperature increase above 20°C, for hydrogen in glass microspheres with 15 % network modifiers" (Monsler at 16), again demonstrating that the permeability of glass to hydrogen is a function of temperature. As Monsler demonstrates, heating does *not* fracture the microbubbles, which would be an irreversible process. To the contrary, heating *reversibly* alters the permeability of the microbubbles to hydrogen. Monsler demonstrates that the glass microspheres can be heated to *fill* them with hydrogen as well as to *release* hydrogen. Yet, if heating fractured the microbubbles, heating could not be used to *fill* the microbubbles. (Filling microbubbles by use of heat is also demonstrated in the present Specification at Examples 1 and 5.) The Monsler reference itself demonstrates that heating cannot be characterized as "fracturing".

Thus, the rejection of claims 31-33 under 35 USC § 103(a) has been overcome and should be reversed.

CONCLUSION

For the foregoing reasons, appellants respectfully submit that the Examiner has erred in rejecting this application. Please reverse the Examiner on all counts.

Respectfully submitted,

April 18, 2008
Date

By: _____
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CLAIMS APPENDIX

We claim:

31. An apparatus for delivering gas at a controlled rate comprising

a) an article comprising at least one containment means comprising pressurized gas-filled microbubbles, said gas being releasable on demand,

b) a means for causing release of said gas from said microbubbles by fracturing, and

c) a feedback and control means for releasing gas to an electrochemical power device at a controlled rate determined by a load.

32. The apparatus according to claim 31 wherein said feedback and control means comprises at least one of a load sensing device, a reference signal, a motor controller, a fracture release mechanism, an electrochemical power device, and a starting battery and circuit.

33. The apparatus according to claim 31 wherein said electrochemical power device is a fuel cell.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.